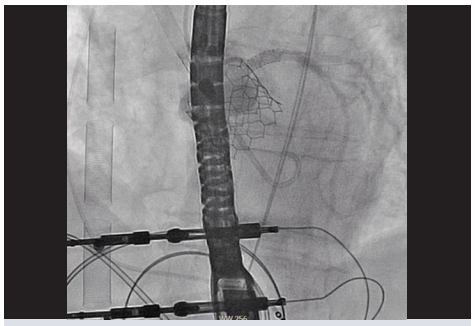
Cath Lab Digest

A product, news & clinical update for the cardiac catheterization laboratory specialist



CASE REPORT

Left Main Coronary Artery Occlusion Following Transcatheter Aortic Valve Replacement

Monarch Shah, MD; Michelle Nabi; Shreya Patel; Riya-Aisha Patel; Pratik Patel, MD, FACC

We report herein a case of hemodynamic collapse immediately after transfemoral transcatheter aortic valve replacement (TAVR) using a balloon-expanding valve, resulting from extrinsic compression of the left main coronary artery by the native calcified leaflets. Due to early identification and immediate stent implantation in the left main coronary artery, the patient was successfully treated and had an uneventful hospital stay until discharge. Potential risk factors include shallow sinus of Valsalva, low coronary ostia height, heavily calcified aortic cusp and valve leaflets, and the use of balloon-expandable valves. However, a correct diagnosis of this complication can lead to a successful percutaneous treatment, as presented in this case.

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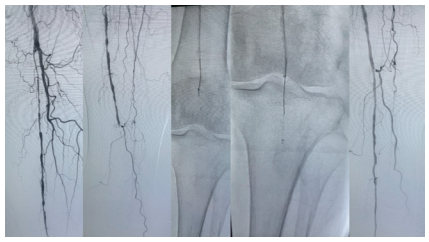
In This Issue

PERIPHERAL ARTERIAL DISEASE

Crossing Peripheral Chronic Total Occlusions Efficiently With the Crosser iQ™ CTO Recanalization System

Cath Lab Digest talks with Ehrin J. Armstrong, MD.

Can you tell us about your practice?



I am an interventional cardiologist at Adventist Heart and Vascular Institute. We have an extensive practice focused on limb salvage and limb preservation in patients with advanced peripheral artery disease (PAD). This includes patients with severe claudication, who have severe impairment in their quality of life and can't do their normal daily activities, and importantly, patients with wounds and rest pain who are at major risk of below-knee amputation. We have a large referral area that extends north of Napa Valley up to the border with Oregon, and treat a lot of people from rural areas who have extensive PAD and are at major risk for amputation. We do everything we can to revascularize their legs and improve their wound healing.

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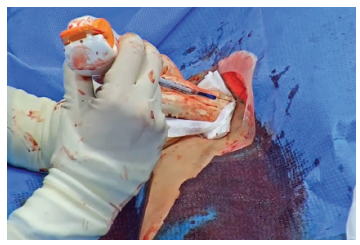
CASE REPORT

Novel Approach in Percutaneous Large-Bore Arteriotomy Closure: Manta With Angiographic Guidance

Darren Jat-Lon Wong, MBBS; Yam Hong Wong, MBBS; Ka Hei Ho, MBChB; Ho Lam, MBChB; Ping Wa Yam, MBBS



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Novel Approach in Percutaneous Large-Bore Arteriotomy Closure: Manta With Angiographic Guidance

Darren Jat-Lon Wong, MBBS; Yam Hong Wong, MBBS; Ka Hei Ho, MBChB; Ho Lam, MBChB; Ping Wa Yam, MBBS

We present two cases of percutaneous closure of an Impella CP (Abiomed) and venoarterial extracorporeal membrane oxygenation (VA-ECMO), respectively, with the use of a Manta vascular closure device (VCD) (Teleflex) and angiogram-guided measurement of skin-to-arteriotomy distance, which is shown to be simple, safe, effective, and time- and manpower-saving.

History of Presentation, Investigation, and Management

This article describes two cases of acute myocardial infarction with cardiogenic shock. The first patient required Impella CP support, while the second patient required a combination of VA-ECMO and Impella CP. The cardiac function of both patients recovered after a staged percutaneous coronary intervention (PCI) was completed several days after the first procedure. Thus, weaning of the Impella CP in the first patient and VA-ECMO in the second patient was planned.

Procedure #1 – Removal of Impella CP Using a 14 French Manta

Measurement

1. A vascular access used for PCI was already in place, contralateral to that used for the Impella. This vascular access serves as: (A) a portal for contrast injection and angiographic measurement; (B) a portal for post-closure evaluation by digital subtraction angiogram (DSA); and (C) an emergency access for salvage in case of closure device failure. Alternatively, access can be obtained on the same as the Impella device by puncturing the superficial femoral artery (SFA) distal to the arteriotomy, with the sheath inserted retrograde.
2. The skin entry of the Impella was marked with a metal pointer.
3. A ruler with a sterile cover was placed parallel to the Impella driveline in the coronal plane under fluoroscopy (Figures 1-2).
4. Without changing the alignment of the ruler, an angiogram at a left anterior oblique 90-degree (true lateral) angle was performed, with contrast injected via a cross-over internal mammary (IM) catheter. Apart from measuring the skin-arteriotomy distance, this angiogram also confirmed the position of the arteriotomy, which was well above the femoral bifurcation.
5. Calibration of the length was done, and the distance between the skin (marked with the metal pointer) to the Impella arteriotomy was measured (Figure 3).

Regain vascular access

6. Access was regained by delivering the .035-inch J-wire to the aorta through the reaccess port. The Impella was then removed, while the wire was kept (if an earlier version of the Impella is used where no reaccess port is available, vascular access can be regained by puncturing the Impella driveline and bringing the wire into the aorta, a procedure outlined by Bhalla et al[1]).
7. A 14 French (Fr) Manta was deployed in the usual fashion (Figure 4).

Closure

8. A DSA was performed to ensure satisfactory hemostasis (Video 1, available online at cathlabdigest.com with the article).
9. Skin and track oozing was stopped by manual compression before the Manta was cut loose.
10. The PCI sheath was removed and the arteriotomy was closed by a 6 Fr collagen-based VCD (Angio-Seal [Terumo]).

The patient completed rehabilitation and was discharged home 5 weeks after admission.

Procedure #2 — VA-ECMO Decannulation Using a 14 Fr Manta

Using the same steps above, the 17 Fr return cannula of the VA-ECMO system was removed

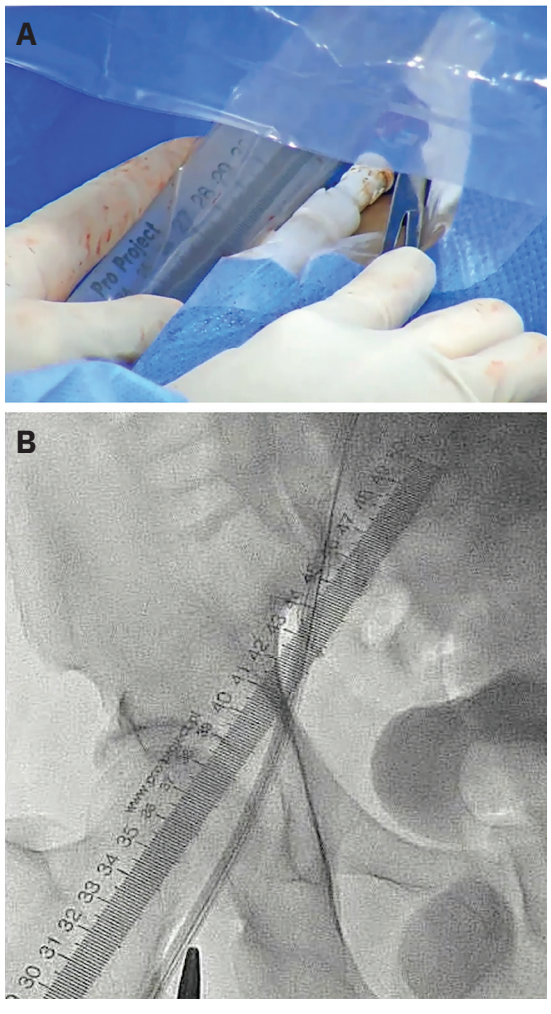

Figure 1A-B. (A) Skin entry was marked with a metal pointer, and the Impella (Abiomed) driveline aligned with a ruler. (B) How it appears on fluoroscopy.

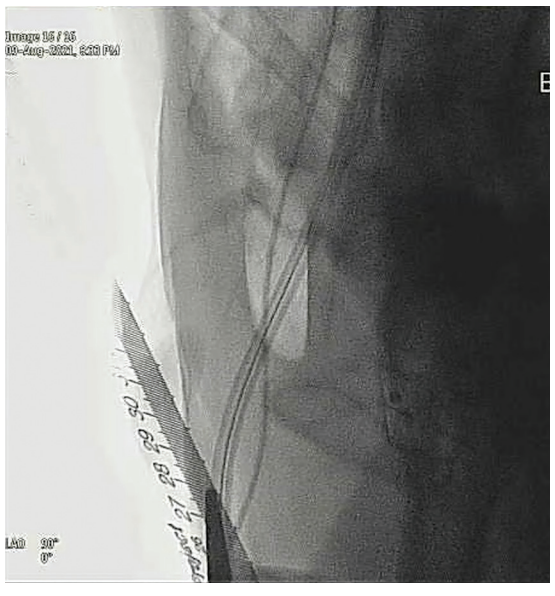

Figure 2. True lateral view of the metal pointer, ruler, and the Impella driveline.

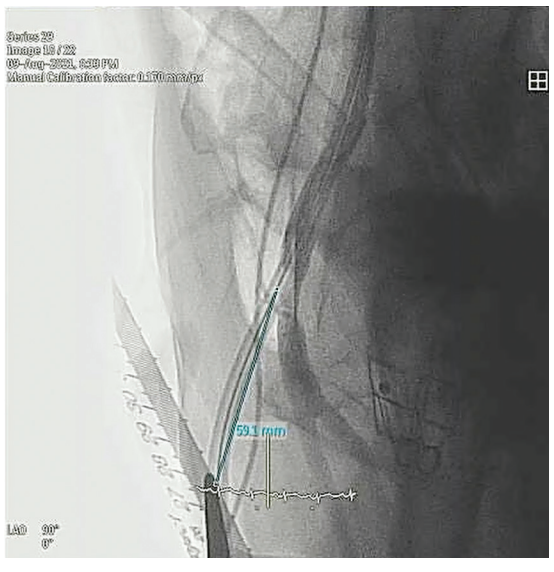

Figure 3. Angiogram demarcating the arteriotomy site. The skin-to-arteriotomy distance was measured after calibration.

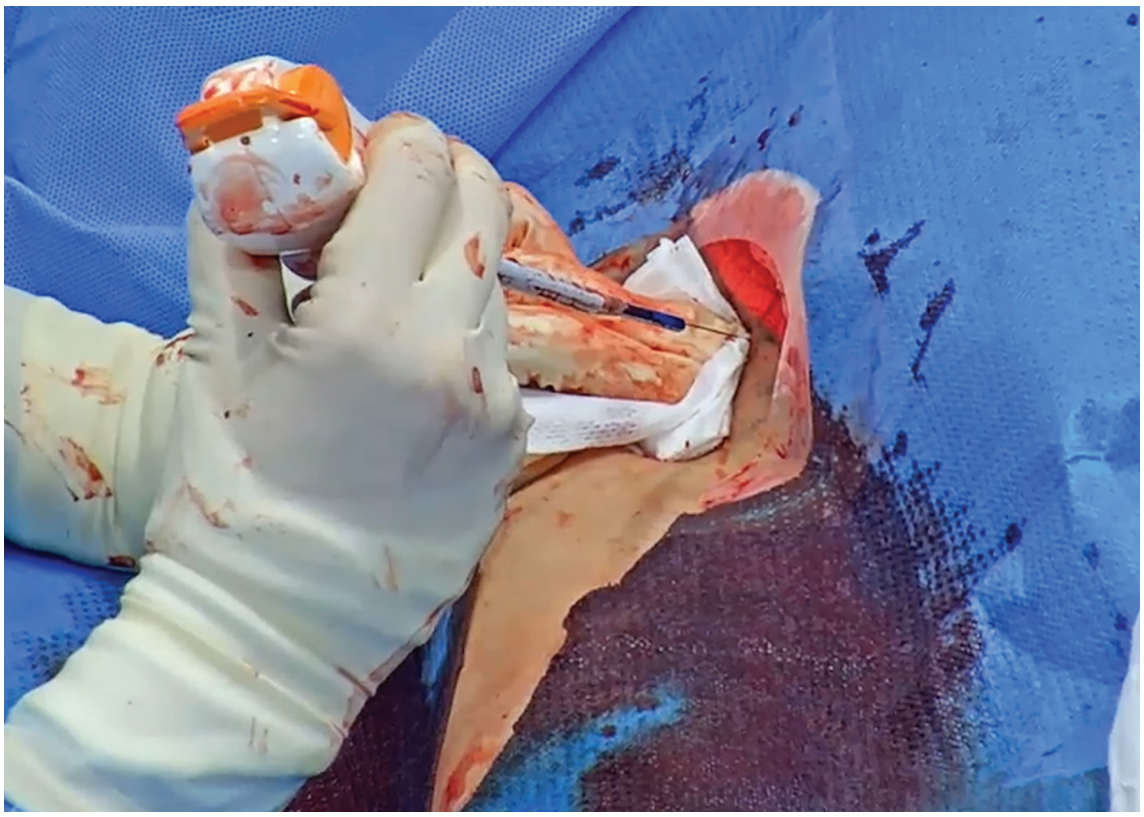

Figure 4. 14 French Manta (Teleflex) deployment.

and the arteriotomy closed with a 14 Fr Manta. On angiography, it was noted that the return cannula entry was at the profunda femoris artery instead of the superficial femoral artery (SFA). However, it did not affect the closure procedure (Video 2, available online at cathlabdigest.com with the article).

The VA-ECMO access cannula was closed with a figure-of-8 knot and manual compression, while the reperfusion catheter arteriotomies were closed with the combination of a collagen-based VCD and suture-based VCD (Perclose ProGlide [Abbott Vascular]).

The patient was later discharged after completing rehabilitation.

Discussion

Various percutaneous closure techniques for large-bore arteriotomy have been described, such as computed tomography (CT) or ultrasound- guided Manta closure[2,3], pre or post closure with two suture-based VCDs, or a combination of one suture-based VCD and one collagen-based VCD.[4,5] However, we find transporting a patient to CT disruptive, and time- and manpower-consuming, while ultrasound-guided closure is operator dependent, and is subjected to erroneous measurement, usually a result of undue pressure exerted on the skin through the ultrasound probe. Pre closure poses an infection risk, as the sutures are exposed for days, and post closure with a suture-based VCD, especially for VA-ECMO, risks the sutures being deployed improperly owing to the large size of the arteriotomy,[5] although this can be mitigated using diligent ultrasound guidance.

The technique described herein of Manta closure with angiogram-guided measurement offers several advantages. First, it is less technically demanding and therefore, offers reproducible results. Second, hemostasis can be checked using DSA. Third, if complications occur, an already-in-place vascular access allows for rapid remedial action. This technique is especially well-suited when the patient is already on mechanical circulatory support, requires a staged procedure such as PCI to be done in the catheterization laboratory, and is expected to be decannulated in the same setting, since vascular access for the closure procedure is already in place.

Angiogram-guided percutaneous closure with a Manta closure device for the large-bore arteriotomy required by use of VA-ECMO and Impella is simple, safe, effective, and time- and manpower-saving.

Conclusion

Angiogram-guided percutaneous closure with a Manta closure device for the large-bore arteriotomy required by use of VA-ECMO and Impella is simple, safe, effective, and time- and manpower-saving. ■

Acknowledgements. We would like to thank all members of the cardiology team of Tuen Mun Hospital, Hong Kong, for their professional assistance on different aspects in the field of cardiology, from clerical to clinical work.

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Disclosures: The authors report no conflicts of interest regarding the content herein.

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